

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau

(43) International Publication Date
13 May 2004 (13.05.2004)

PCT

(10) International Publication Number
WO 2004/039643 A1(51) International Patent Classification⁷: B60R 22/22, 22/26, B60N 2/42, 2/427, B64D 25/06, B61D 33/00

(72) Inventor; and

(75) Inventor/Applicant (for US only): LEWIS, Gordon [AU/AU]; c/- G & J Lewis Enterprises Pty Ltd, Unit 4, 108 Percival Road, Smithfield, New South Wales 2164 (AU).

(21) International Application Number:
PCT/AU2003/001440

(74) Agent: GRIFFITH HACK; GPO Box 4164, Sydney, New South Wales 2001 (AU).

(22) International Filing Date: 31 October 2003 (31.10.2003)

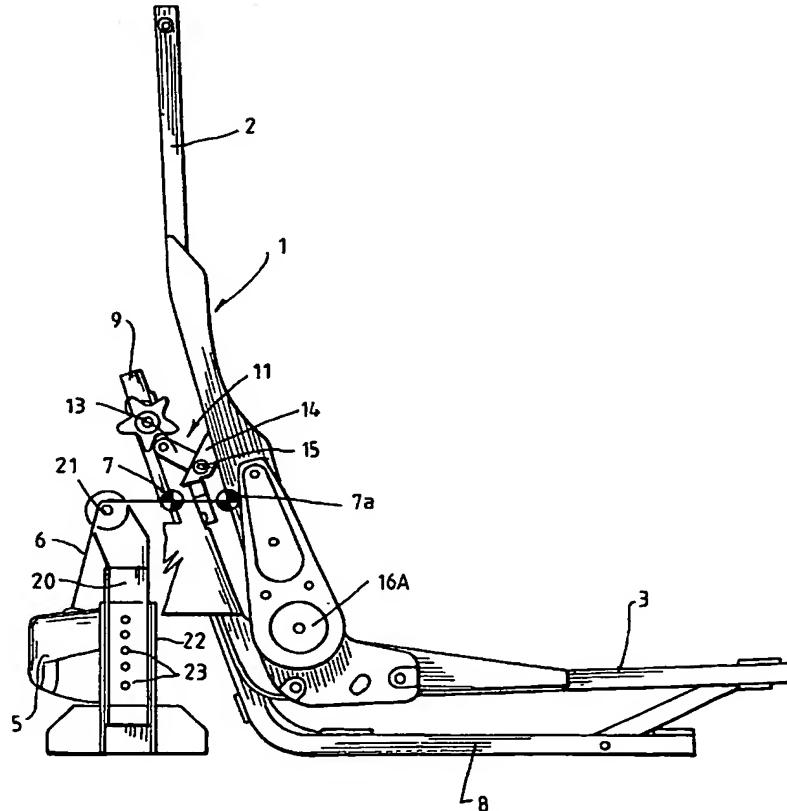
(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(25) Filing Language: English
(26) Publication Language: English
(30) Priority Data:
2002952404 31 October 2002 (31.10.2002) AU
2003904806 3 September 2003 (03.09.2003) AU

(84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) Title: VEHICLE SEAT WITH ARRANGEMENT FOR RESISTING LOADS APPLIED TO THE SEAT



(57) Abstract: A vehicle seat (1) including an arrangement (11) for resisting loads applied to the vehicle seat (1) which comprises a seat base (3) and a seat back (2); said arrangement (11) including a link mechanism (13, 14, 15) connected between the seat back (2) and a support member (30) connected to the vehicle. The link mechanism is arranged to prevent motion of the seat (1) back beyond a predetermined position. There is also provided an adjustable tether arrangement including a tether means (4), the tether means (4) being arranged to be mounted between the seat back and a vehicle body and the tether means (4) including a tether strap (6) and a retractor mechanism (5) enabling the tether strap (6) to extend or retract in accordance with allowed motion of the vehicle seat (1).



ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *with international search report*

VEHICLE SEAT WITH ARRANGEMENT FOR RESISTING LOADS APPLIED
TO THE SEAT

Field of the Invention

5 The present invention relates to a vehicle seat which includes an arrangement for resisting loads applied to the vehicle seat, and, particularly, but not exclusively, relates to a vehicle seat including an integrated seat
10 belt.

Background of the Invention

15 It is well known in vehicles to have seat belts attached directly to the vehicle and not to the seat. This has some advantages, such as the vehicle provides a solid anchor for the seat belt and therefore good resistance to application of a load to the seat belt.
20 There are some disadvantages, however. In order to allow for adjustable reclining of the seat, or a change in position of the seat relative to the vehicle a seat belt which is attached to the vehicle will need to be readily adjustable. Because the position of a seat belt is fixed relative to the vehicle, in some adjusted positions of the
25 seat belt the seat may not be in the ideal position for the user. In general, integrated seat belts (where the seat belts are attached to the seat and not to the vehicle) are considered to be safer than seat belts that are anchored to the vehicle. Further, in some cases it is
30 difficult to anchor a seat belt to a vehicle and the seat belt must be integrated with the seat. Examples of this include public transport eg. seats on buses that are not near the walls of the vehicles. In suspension seats, where the seat is suspended relative to the vehicle for
35 comfort, an integrated seat belt is a safer and more convenient option. Suspension seats are often used in large vehicles such as trucks and military vehicles.

- 2 -

Further, in some cases, legislation requires that seats must have integrated seat belts.

Where a seat is provided with an integrated seat belt, the seat must be arranged to cope with the very high 5 loads that may be applied in the event of an accident.

With lap-sash type or harness type seat belts, where the belt is anchored to an upper portion of the seat back, the seat must be especially strong to resist collapsing when load is applied by the sash or harness. It is in fact 10 often the case that for some types of vehicles where particularly large loads may be applied, only lap belts are provided.

In order to deal with the high loads applied to some seats, it is known to utilise tether straps which attach 15 the seat frame to the vehicle. In this way, at least some of the load applied by the integrated seatbelt can be transmitted via the seat frame to the vehicle. In the event of an accident, the tether strap prevents the seat from collapsing or moving under load. A problem with 20 tether straps is that they are of a fixed length and require adjustment whenever the position of the seat is adjusted or the seat height is changed. If the tether strap is not readjusted correctly. This can be dangerous.

25 Summary of the Invention

In accordance with a first aspect, the present invention provides a vehicle seat arrangement, comprising a seat frame, including a seat base and a seat back, and a 30 support member being arranged to be mounted relative to a vehicle proximate the seat back, and a link means connected between the support member and the seat back, and being arranged to prevent motion of the seat back beyond a predetermined position.

35 The link means may be a mechanical link connected between the support member and the seat back. The link means is arranged to resist motion of the seat frame

relative to the support member beyond a predetermined position. The link means is preferably strong enough to resist motion of the seat back relative to the support member under a load, such as a load that may be applied to 5 the seat back during a vehicle accident.

The vehicle seat arrangement may include an integral seat belt. This may be a lap and sash arrangement or it may be a harness arrangement. The seat back may include a seat belt mounting for carrying a sash-type seat belt.

10 The support member may form part of a suspension arrangement and may comprise a frame member supporting a suspension arrangement for the seat frame.

15 The link means may form or form part of a recliner mechanism arranged to control the reclining of the seat back.

20 In a preferred embodiment, an advantage of having a strong link mounted between a support member (perhaps being part of a suspension arrangement) which is mounted relative to the vehicle, and the seat back obviates the requirement for any tether arrangement as long as the link and support member are strong enough to resist loads that may be applied. The link means is preferably positioned between the seat back and the support member to a position which is remote from a pivot connection between the seat 25 back and seat base. The further away from the pivot connection that the link means is positioned and the closer to the seat belt mounting point on the seat back, the less strain will be applied to the link means when load is applied via the seat belt to the seat belt mounting. In one embodiment, the link means is positioned remote from the pivot connect between the seat back and seat base. In accordance with a second aspect, the present invention provides a vehicle seat arrangement, including a seat frame and a tether means, the tether means being 30 arranged to be mounted between the seat frame and a vehicle body and the tether means including a tether strap and a retractor mechanism enabling the tether strap to

- 4 -

extend or retract in accordance with allowed motion of the seat frame.

The allowed motion of the seat frame may be normal motion, such as adjustment of the seat position backwards or forwards with respect to the vehicle, or the normal up and down motion of a suspension seat. During unusual motion, however, such as may occur when a sudden load is applied to the seat during an accident, the tether strap does not extend or retract and operates to retain the seat frame with respect to the vehicle body, acting as an anchor. Preferably, the retractor mechanism includes an inertia reel mechanism, which is arranged to lock when motion of the seat frame exceeds a pre-determined inertial threshold. The advantages of having a tether strap which is able to extend and retract during normal motion include the ability to be able to adjust the position of the seat without having to adjust a fixed length tether strap, and also the ability to allow a free range of motion for any suspension system without having to worry about a fixed length tether strap.

In one embodiment, the tether means is height adjustable so that it may cope with corresponding adjustments in seat height whilst maintaining an optimum anchor point for the seat.

The seat arrangement preferably includes a suspension arrangement which allows the seat frame to move relative to the vehicle in accordance with the suspension. The seat frame is preferably supported by the suspension arrangement which includes a support member mounted relative to the vehicle. In one embodiment, the tether means is mounted at one end therefore to the support member. Where the tether means is mounted to the support member, preferably a link means is provided between the support member and the seat frame, the link means being arranged to resist motion of the seat frame relative to the support member. Preferably, the link means is arranged to extend to a pre-determined point, to

- 5 -

allow some limited motion between the seat frame and the suspension system, but does not allow motion past the pre-determined point.

The seat frame preferably comprises a seat base and a seat back. The link is provided between the seat back and the support member. This facilitates mounting of an integrated lap-sash belt to the seat frame, the mounting point for the top part of the sash belt being high up on the seat back.

In a modification of this embodiment, the link means is replaced by a recliner mechanism. This obviates the need for a standard recliner mechanism at the intersection of the seat back and the seat base.

In accordance with a third aspect, the present invention provides a tether arrangement for anchoring a vehicle seat to a vehicle body, the tether arrangement being arranged to be mounted between the seat and vehicle body and including a tether strap and a retractor mechanism enabling the tether strap to extend or retract in accordance with allowed motion of the seat.

In one embodiment, the tether arrangement is height adjustable.

Brief Description of the Drawings

Features and advantages of the present invention will become apparent from the following description of embodiments thereof, by way of example only, with reference to the accompanying drawings, in which;

Figure 1 is a view from the back and one side of a seat arrangement in accordance with an embodiment of the present invention;

Figure 2 is a view from the side of the seat arrangement of figure 1;

Figure 3 is a view from the rear of the seat arrangement of figure 1;

Figure 4 is a further side view of the embodiment of

- 6 -

figure 1;

Figure 5 is a side view of a further embodiment of the present invention, and

5 Figure 6 is a side view of yet a further embodiment of the present invention;

Figure 7 is a side view of yet a further embodiment of the present invention, and

Figure 8 is a detailed schematic view illustrating a linkage between a seat back and support member.

10

Detailed Description of Preferred Embodiment

Referring to the drawings, a seat arrangement in accordance with an embodiment of the present invention, includes a seat frame 1, which in this embodiment includes a seat back 2 and seat base 3. The seat frame may be made from any appropriate material, such as metal, using known techniques. In the drawings the seat frame 1 is shown without any covering. It will be appreciated that in use the frame 1 will be covered by coverings and seat base 3 and seat back 2 cushions. The seat arrangement also includes a tether means, generally designated by reference numeral 4 and which includes a retractor mechanism 5 and a tether strap 6. In this embodiment the retractor mechanism 5 is an inertia reel mechanism including a reel on which the tether strap 6 winds and unwinds. The inertia reel mechanism may be of standard type and is not shown here in detail. In this embodiment the tether strap has one end attached to a mounting 7 on a support member 30 which is arranged to be amounted relative to a vehicle (now shown) in use. The retractor mechanism 5 is arranged to be mounted to a vehicle body, not shown in these drawings. For example, the retractor mechanism 5 could be mounted to the internal wall of the vehicle or a floor of the vehicle. Note that in an alternative embodiment, the retractor mechanism 5 could be mounted to the seat

- 7 -

arrangement and the other end of the tether strap could be mounted to the vehicle, the effect being similar.

In operation, the seat arrangement would be mounted in the vehicle on, for example, rails on the vehicle 5 floor. Rails 8 are shown in the drawings. These may be different from the rails which are mounted on a vehicle floor, but nevertheless are sufficient to illustrate. In this embodiment the rails mount a support member 30. In this arrangement the support member 30 is a frame member 10 of the suspension arrangement (to be described later).

In use, the seat frame 1 may be adjusted in height or forwards or backwards and the inertia reel mechanism 5 enables the tether belt 6 to extend or retract to adjust to the new position of the seat without it being necessary 15 to separately adjust the tether strap 6. During application of a high load to the seat frame 1, such as in an accident, the inertial threshold of the mechanism 5 is exceeded and tether strap 6 anchors the seat frame firmly relative to the vehicle.

20 In this embodiment, the seat arrangement includes a suspension arrangement 9. Suspension arrangement 9 is not shown in detail, but includes a housing 10 mounting a suspension system (not shown). Such suspension arrangements are known, however, and they include 25 resilient means suspending the seat back 2 and seat base 3 for motion relative to the rest of the seat arrangement, for comfort of the user. One form of suspension arrangement is described in applicant's earlier Australian patent number 728411.

30 In this embodiment, the mounting 7 for the tether strap 6 is on a frame member of the suspension arrangement 9.

To constrain motion of the seat back 2 relative to the suspension arrangement 9, a linkage 11 is provided 35 between the frame member 12 of the suspension arrangement and the seat back 2. In this embodiment, the linkage 11 comprises a "scissor" link comprising two members 13 and

- 8 -

14 hinged together at hinge 15. The hinge 15 includes a pin 31 rotably connecting reel members 13 and 14 and mounted in passageways 32 in link member 14 and corresponding passageway (not shown) in link member 13. A 5 further pin 33 seated in passageway 34 in link member 13 mounts the link member 13 to the frame member 12. A further pin (not shown) mounts an end of the link member 14 to the seat back 2. The hinged arrangement of the link 11 enables normal motion of the seat back 2 and seat base 10 3 relative to the suspension arrangement 9 and also enables the seat back to be reclined using recliner mechanism 16A (which is a conventional recliner mechanism). Forward motion of the seat back 2 relative to the suspension arrangement 9 and therefore the tether 15 strap 6 is constrained at the limit of the extension of the link 11, however. In the event of an accident, therefore, where a sudden load is applied to the seat back 2, the seat back will not extend past the extent of the linkage 11 relative to the suspension arrangement.

20 Note that other types of linkage than a scissor linkage may be used, eg. strong webbing.

The seat arrangement is provided with an integrated lap/sash seat belt system 16. The seat belt system includes a seat belt strap 17, and an inertia reel 25 mechanism 18 mounted to the suspension system frame and a sash mounting 19. The sash mounting 19 is at the upper part of the seat back 2 and in the event of an accident a significant amount of leverage will therefore be applied to the seat back. The linkage 11 is therefore strong 30 enough to prevent the seat back from breaking away from the seat suspension, even under the excessive leverage.

Note that in figure 4, for clarity the cover strap and seat belt are not shown.

Figure 5 shows a further embodiment of a suspension 35 seat in accordance with the present invention. The same reference numerals have been used for similar components to the components of figures 1 to 4, and no further

- 9 -

description will be given here of those components. Note that the seat belt retractor mechanism mounting 18 is not shown in figure 5, for the purposes of clarity, although in operation it would be present.

5 In the embodiment of figure 5, the tether strap 6 is mounted to enable height adjustment. Height adjustable column 20 mounts at a top end thereof a roller or guide 21 over which the tether 6 is arranged to pass. Column 20 can be moved within sleeve 22 and incorporating holes 23
10 in the sleeve and column enable the height of the column 22 be adjusted and retained. The height of the roller or guide 21 can therefore be adjusted in order to adjust the height of the tether strap 6 relative to the seat frame 1. Note that the tether strap 6 may be connected to the
15 suspension frame (tether point 7) or directly to the seat back (tether point 7a).

In some seat arrangements with suspension arrangements, the suspension arrangement is not at the back of a seat as indicated in this embodiment, but
20 elsewhere. The linkage 11 may then be mounted to a support member provided at the back of the seat arrangement.

25 In a further alternative, the tether strap may be connected directly to the seat back 2 (as in figure 5), thus avoiding the need for the linkage 11.

Figure 6 is a side view of a further embodiment of the present invention. This embodiment is a modification of the embodiment of figure 5 and the same reference numerals have been used in figure 6 for equivalent
30 components to those of figure 5. The modification relates to the linkage between the suspension system 9 and the seat back 2. In this variation, the linkage is replaced by a recliner mechanism 25. The recliner mechanism 25 includes a rotatable handle 26 which can be rotated to
35 adjust the extension of a linkage 27 connecting the suspension arrangement 9 and seat back 2. Rotation of the handle 26 extends or retracts the linkage 27 to effect

- 10 -

reclining of the seat back 2. The recliner mechanism 25 may be a standard recliner mechanism, with standard adjustment. The difference here is that the linkage is strong enough to support a load applied to the seat back 2 5 in the event of an accident.

In this embodiment there is no need for the conventional recliner mechanism, usually mounted between the seat back and seat base (as in the figure 1 and figure 10 5 embodiments). Instead, this conventional recliner mechanism is replaced by a pivot 28 connecting the seat back 2 and the seat base 3.

The tether mechanism may be fitted with a pre-tension seat belt retractor, similar to that applied in modern vehicles, which operates to draw in the tether strap in 15 15 collisions.

In the above embodiment, only one tether means is used. More than one tether means can be used to anchor the seat.

In the above embodiment, the seat arrangement 20 includes a suspension mechanism. It need not do. The tether mechanism may be applied with a conventional, non-suspension, seat.

Yet a further embodiment of the present invention is 25 illustrated in figure 7. Again, the same reference numerals have been used for equivalent components illustrated in other figures. A further detailed description of these components will not be given here.

In this embodiment, a tether strap is dispensed with. The arrangement relies on the link means 26 to resist any 30 load applied to the seat back 1 by, for example, a load on the seat back 2 applied by the integral lap/sash type seat belt (figure 3). The support member 12 and rails 8 are made strong enough to resist this load.

Either a link 11, such as illustrated in figures 1-5, 35 or a recliner link 26 as illustrated in figure 6 may be utilised.

Figure 8 is a schematic detail of an appropriate

- 11 -

recliner link mechanism 26 which could be utilised in any of the embodiments discussed above as the link means to connect the seat back to the support member 12. The recliner mechanism 25 shown includes a hand wheel 26 which 5 actuates an epicyclic gear train, as is known in standard recliner mechanisms of this type. An alternative would be to use a lever controlled rack arrangement.

The recliner mechanism 25 is placed remotely from the seat back pivot. Leverage applied by a seat belt having a 10 mounting point at the top of the seat back will be less to the linkage 25 than at the pivot point.

Modifications and variations as would be apparent with skilled addressee and deemed to be within the scope of the present invention.

CLAIMS

1. A vehicle seat arrangement, comprising a seat frame, including a seat base and a seat back, and a support member arranged to be mounted relative to a vehicle
5 proximate the seat back, and a link means connected between the support member and the seat back, and being arranged to prevent motion of the seat back beyond the predetermined position.
2. A vehicle seat arrangement in accordance with claim
10 1, wherein the link means is a mechanical scissor link.
3. A vehicle seat arrangement in accordance with claim 1, wherein the link means includes a recliner mechanism.
4. A vehicle seat arrangement in accordance with claim 1, 2 or 3, the link means being strong enough to resist
15 motion of the seat frame relative to the support member beyond a predetermined position when a load is applied to the seat back such as may be applied by a seat belt mounting of the seat back in a vehicle accident.
5. A vehicle seat arrangement in accordance with any one
20 of the preceding claims, including an integral seat belt.
6. A vehicle seat arrangement in accordance with any one of the preceding claims, being a suspension seat and including a suspension arrangement the same member of which forms the support member.
- 25 7. A vehicle seat arrangement in accordance with any one of the preceding claims, wherein the link means is positioned remote from a pivot connection between the seat back and the seat base.
8. A vehicle seat arrangement, including a seat frame
30 and a tether means, the tether means being arranged to be mounted between the seat frame and a vehicle body and the tether means including a tether strap and a retractor mechanism enabling the tether strap to extend or retract in accordance with allowed motion of the seat frame.
- 35 9. A vehicle seat arrangement in accordance with claim 8, wherein the retractor mechanism is an inertia reel mechanism.

10. A vehicle seat arrangement in accordance with claim 8 or claim 9, wherein the seat frame includes a seat back and a seat base and a seat support supporting the seat back and seat base, and wherein the tether means is 5 mounted to the seat support, and wherein a link means is provided between the seat back and the seat support, the link means being extendable to a pre-determined position, but not extendable past the pre-determined position whereby to constrain the seat back relative to the seat 10 support.

11. A seat arrangement in accordance with claim 10, wherein the seat support also mounts a suspension arrangement.

12. A seat arrangement in accordance with claim 10 or 15 claim 11, wherein the link means comprises a recliner mechanism.

13. A seat arrangement in accordance with anyone of claims 8 to 13, wherein the seat arrangement includes an integrated seat belt.

20 14. A seat arrangement in accordance with claim 3 wherein the integrated seat belt is a lap-sash type seat belt or a harness.

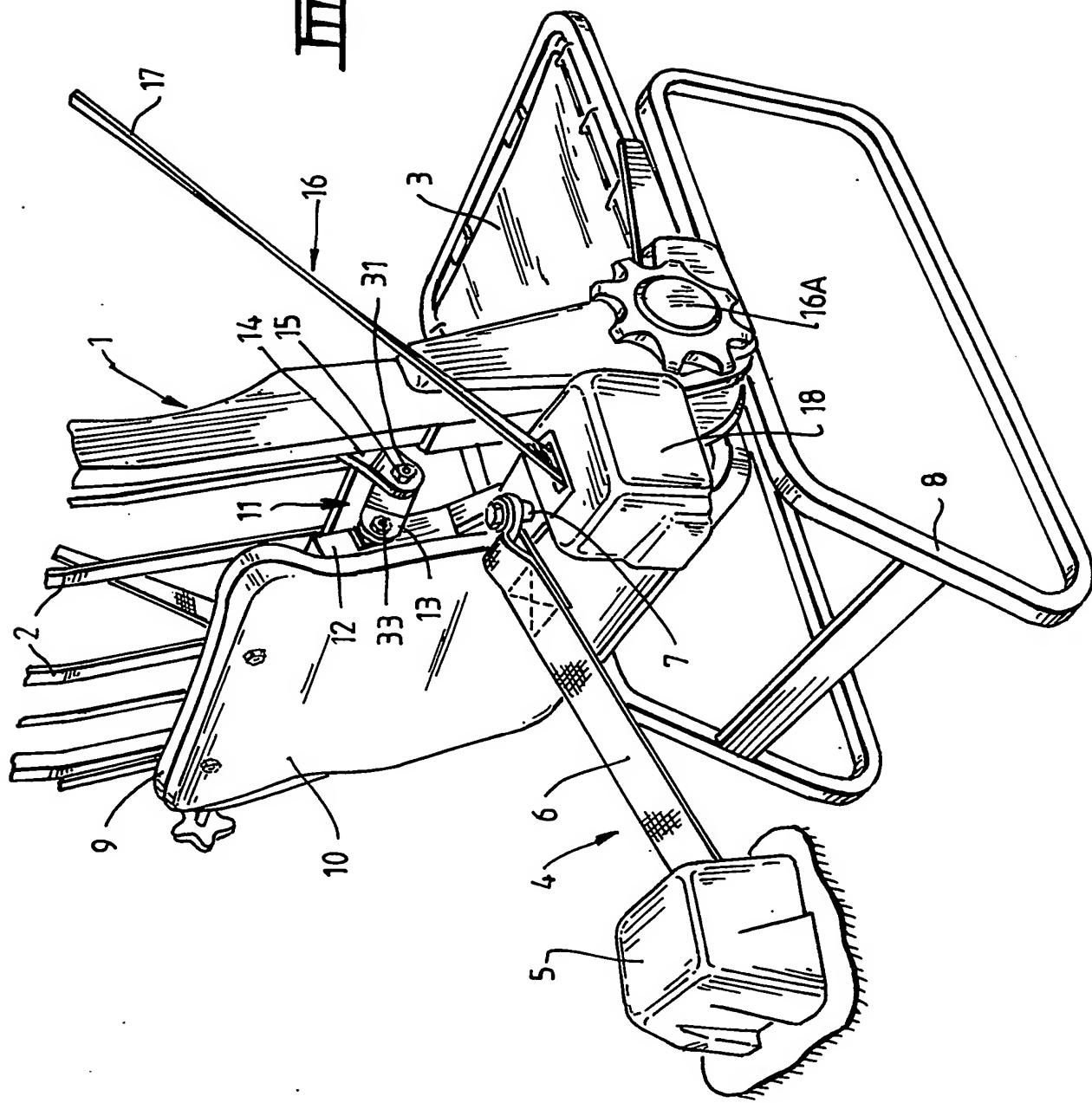
15. A seat arrangement in accordance with any one claims 8 to 14, wherein the tether means is height adjustable.

25 16. A seat arrangement in accordance with claim 15, further comprising a roller or guide over which the tether strap passes, the roller or guide being height adjustable, to adjust the effective height of the tether strap.

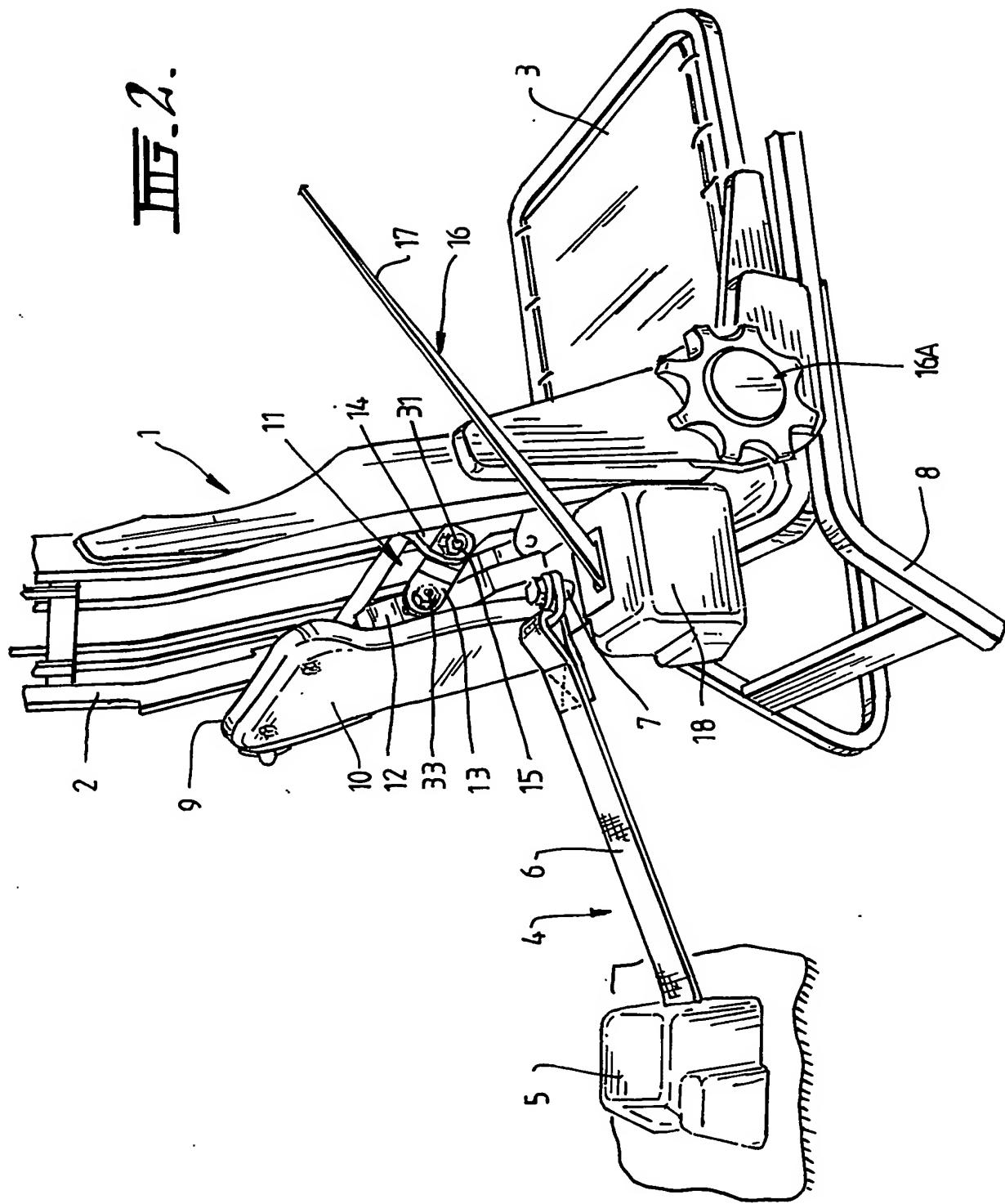
17. A tether arrangement for anchoring a vehicle seat to 30 a vehicle body, the tether arrangement being arranged to be mounted between the seat and vehicle body and including a tether strap and a retractor mechanism enabling the tether strap to extend or retract in accordance with allowed motion of the seat.

1/8

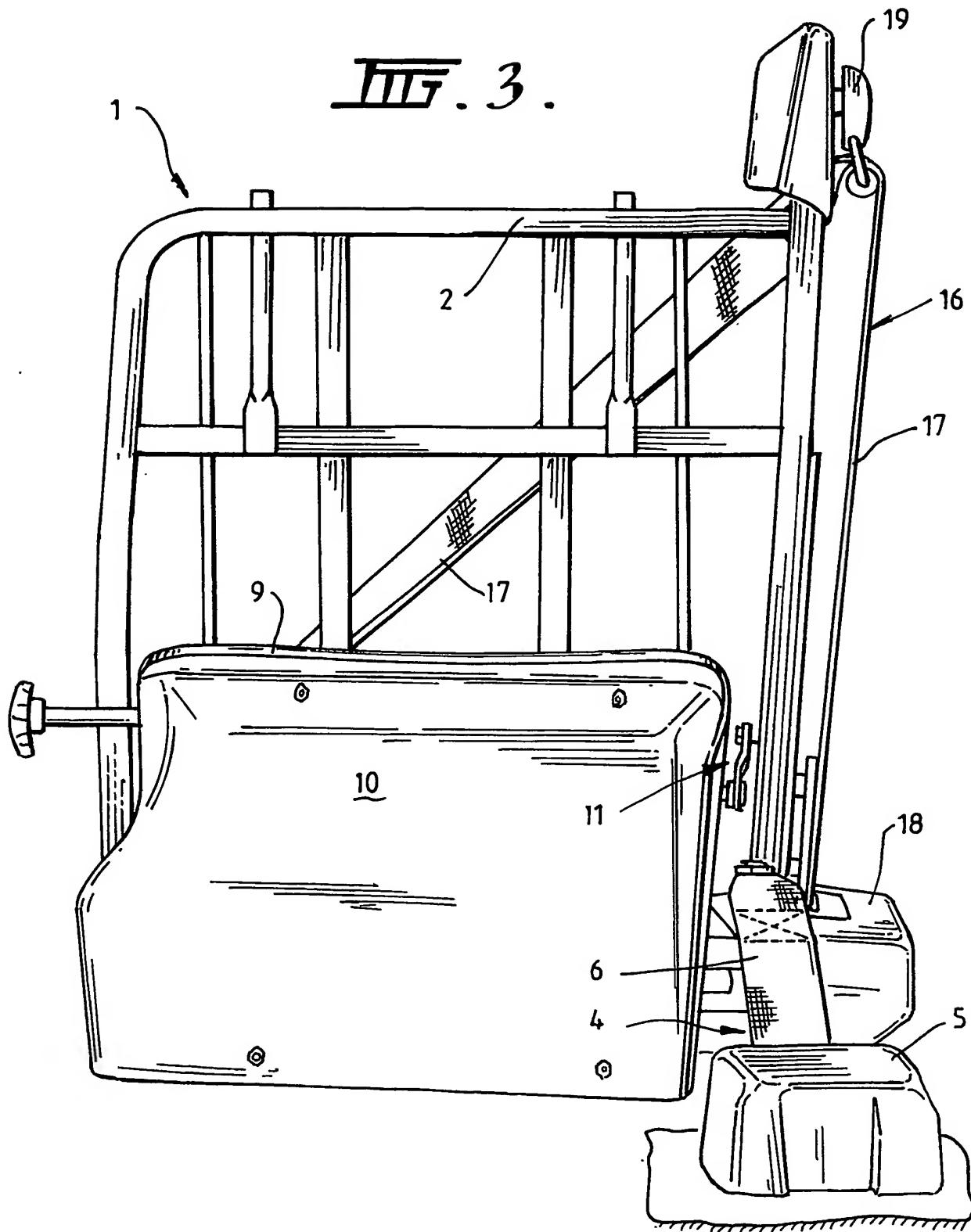
III. 1.



2/8

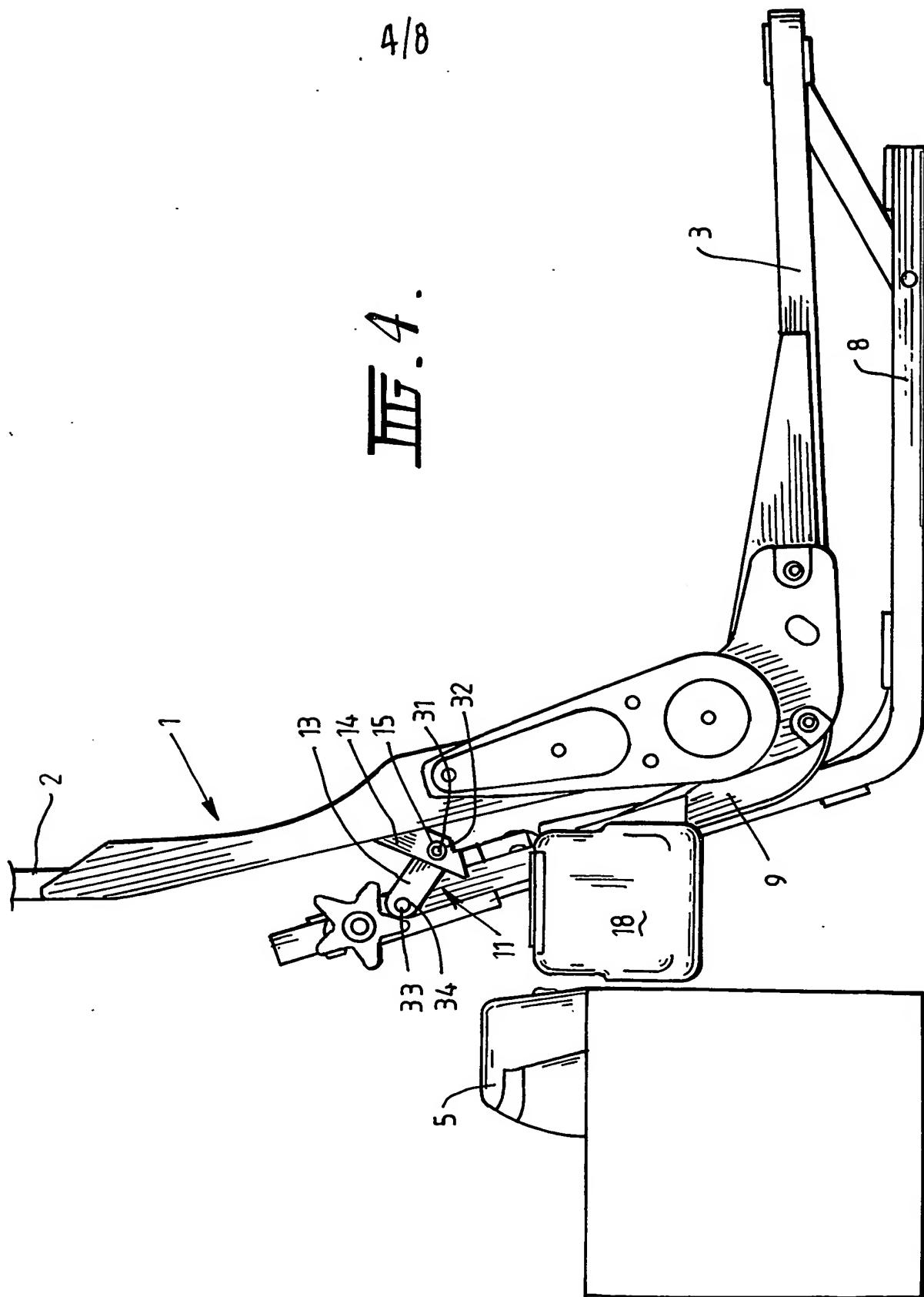
FIG. 2.

3/8

FIG. 3.

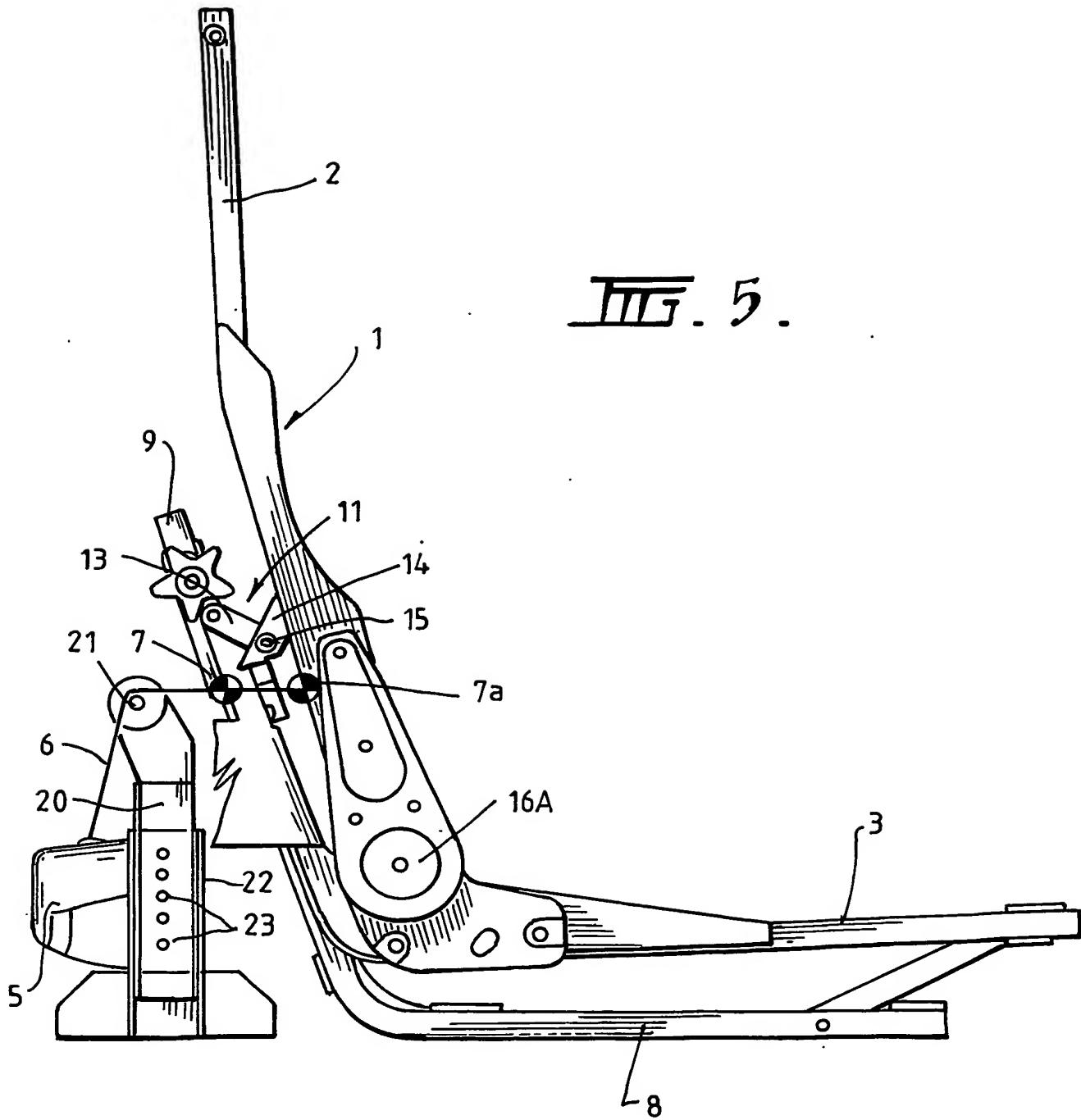
4/8

III-4.



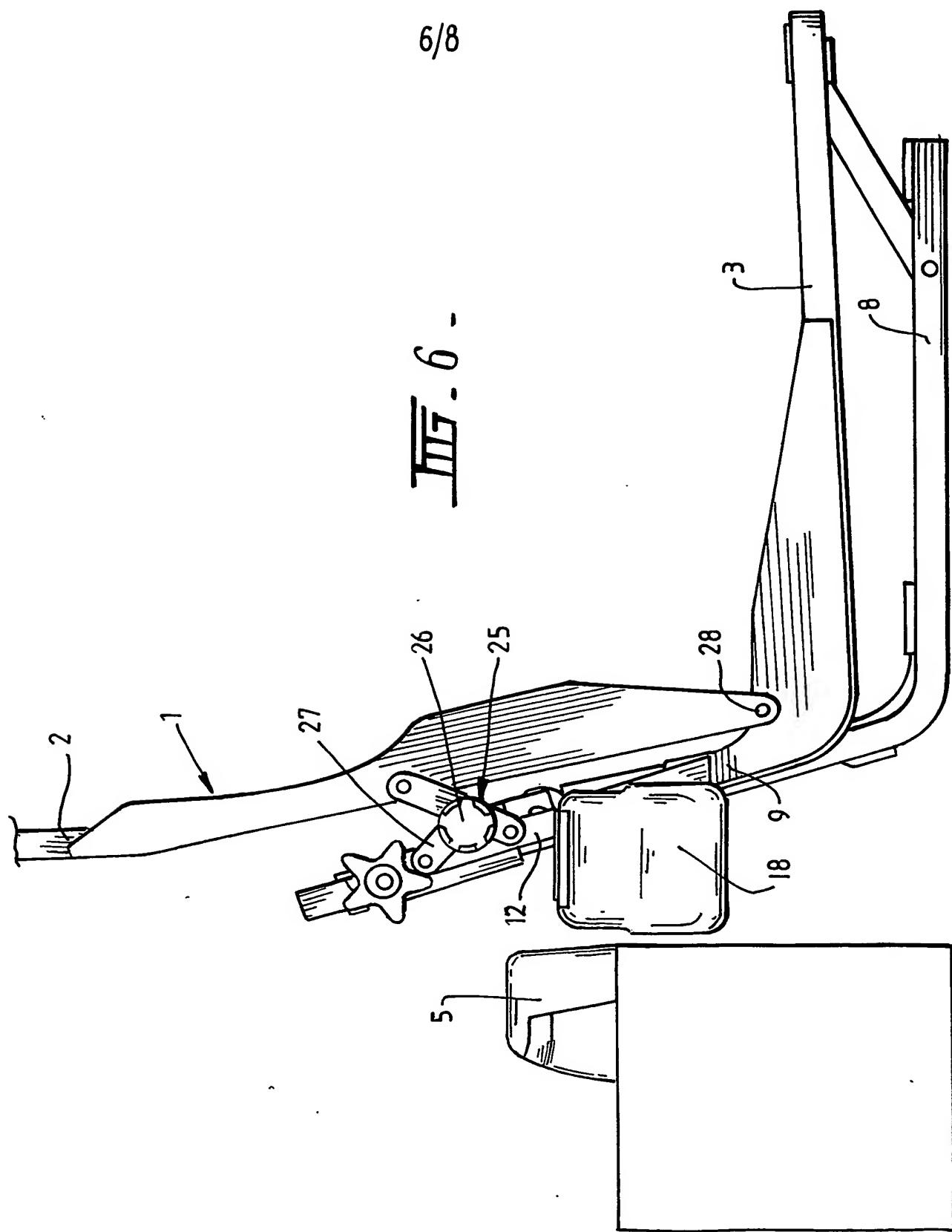
5/8

FIG. 5.

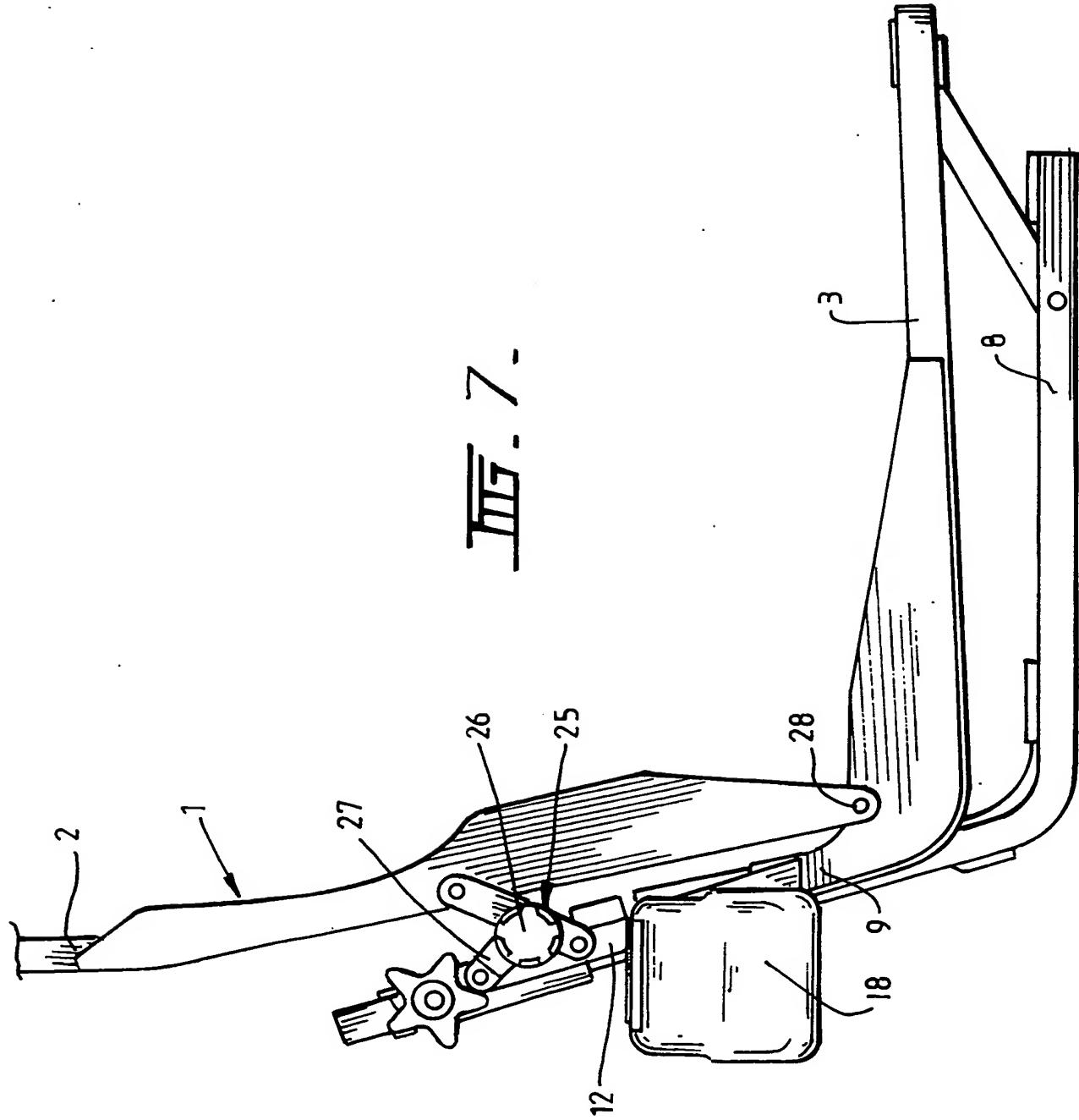


6/8

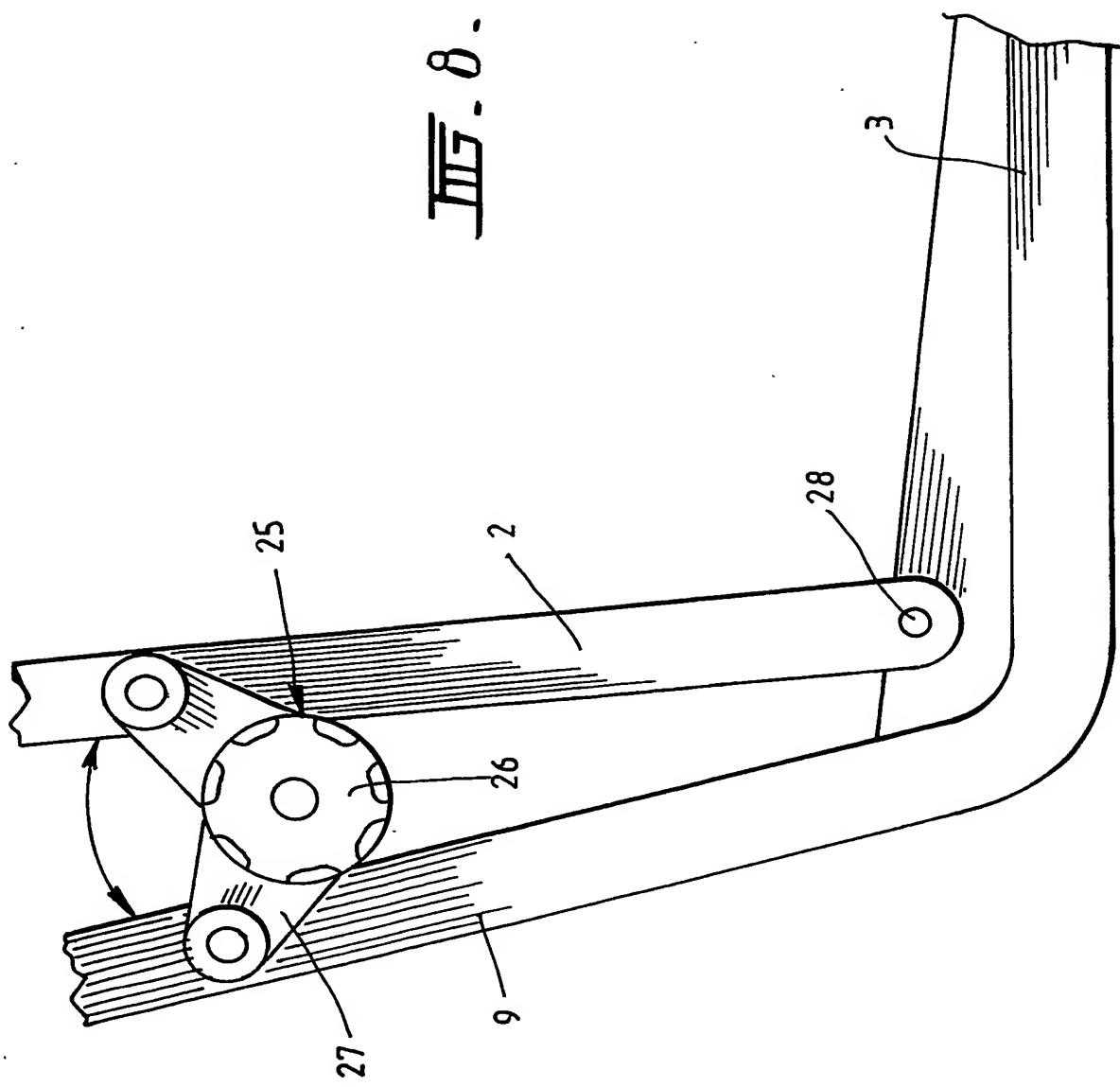
三六



7/8

III-7-

8/8

III-8.

INTERNATIONAL SEARCH REPORT

International application No. PCT/AU2003/001440
--

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. ⁷: B60R 22/22, 22/26; B60N 2/42, 2/427; B64D 25/06; B61D 33/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
DWPI: B60R 22/-, B60R 2/42-, B64D 25/06, B61D 33/00 & keywords: rear, back, link, restrain, collapse, prevent, anchor, support, scissor, resist, recline, strap, tether, belt, harness, retract, rewind, recoil

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2000/050259 A1 (ANDUM HB) 31 August 2000 Page 8 lines 6-34	1, 3-7
X	DE 19528308 A1 (MERCEDES-BENZ AKTIENGESELLSCHAFT) 6 February 1997 Figure 1	1, 3-7
X	DE3838656 A1 (BAYERISCHE MOTOREN WERKE AG) 17 May 1990 Whole document	1, 4

Further documents are listed in the continuation of Box C See patent family annex

"A"	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent but published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search
19 February 2004

Date of mailing of the international search report
25 FEB 2004

Name and mailing address of the ISA/AU
AUSTRALIAN PATENT OFFICE
PO BOX 200, WODEN ACT 2606, AUSTRALIA
E-mail address: pct@ipaaustralia.gov.au
Facsimile No. (02) 6283 3929

Authorized officer
D.R. LUM
Telephone No : (02) 6283 2544

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2003/001440

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 3921996 A1 (AUSTRIA METALL AG) 11 January 1990 Figures 2, 3	1, 4-7
X	EP 451035 B1 (BERTRAND FAURE AUTOMOBILE) 3 November 1993 Figures 3, 4	1, 3-6
X	DE 3813557 A1 (F PORSCHE AG) 2 November 1989 See figure 1	1, 3-17
X	US 5015010 A1 (HOMEIER et al) 14 May 1991 Whole document	8, 9, 15-17
X	EP 553062 A2 (INDIANA MILLS & MANUFACTURING, INC.) 28 July 1993 Column 6 lines 25 - 45	8, 9, 15-17
X	US 6322140 B1 (JESSUP et al) 27 November 2001 See figure 3	8, 9, 15-17
NOTE:	Any one of the documents which are relevant to claim 1 (link means) (first six of the above mentioned documents) may be combined with any one of the remainder of the above mentioned documents which are relevant to claim 8 (tether means) resulting in a "Y" category for claims 10-14	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2003/001440**Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos :
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos :
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos :
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box II Observations where unity of invention is lacking (Continuation of Item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See attached sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

The additional search fees were accompanied by the applicant's protest.
 No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2003/001440

Supplemental Box

(To be used when the space in any of Boxes I to VIII is not sufficient)

Continuation of Box No: II

The international application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept. In coming to this conclusion the International Searching Authority has found that there are different inventions as follows:

1. Claims 1-7 are directed to a vehicle seat arrangement including a link means arranged between the seat back and a support member to prevent motion of the seat back beyond a predetermined position. It is considered that the link means comprises a first "special technical feature".
2. Claims 8-16 are directed to a vehicle seat arrangement including a tether means which comprises a tether strap and a retractor mechanism. Claim 17 is directed to a tether arrangement including a tether strap and a retractor mechanism for anchoring a vehicle seat. It is considered that the retractor means comprises a second special technical feature.

Since the abovementioned groups of claims do not share any of the technical features identified, a "technical relationship" between the inventions, as defined in PCT rule 13.2 does not exist. Accordingly the international application does not relate to one invention or to a single inventive concept, a priori.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2003/001440

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
WO	0050259	AU	33401/00	EP	1163126	SE	9900649
DE	19528308		NONE				
DE	3921996		NONE				
DE	3838656		NONE				
EP	0451035	BR	9101333	CA	2039653	CS	9100798
		FR	2660606	IE	911061	JP	5286385
		NO	911191	PT	97246	US	5246271
DE	3813557		NONE				
US	5015010	CA	2037661	EP	0447364		
EP	0553062	CA	2086363	MX	9300162	US	5219206
		US	5219207				
US	6322140	CA	2155390	EP	0756974	US	5451094
END OF ANNEX							